Blood Sugar 101

Semper Fit
Health Promotion

ENERGY IMPROVEMENT

- " . . . If someone wanted to focus on just one thing to improve their energy, which one would you recommend?"

- "The answer is simpler than you might think . . . Energy comes through consumption of food, and we have found that stabilizing blood sugar is probably the single most important thing we can do.

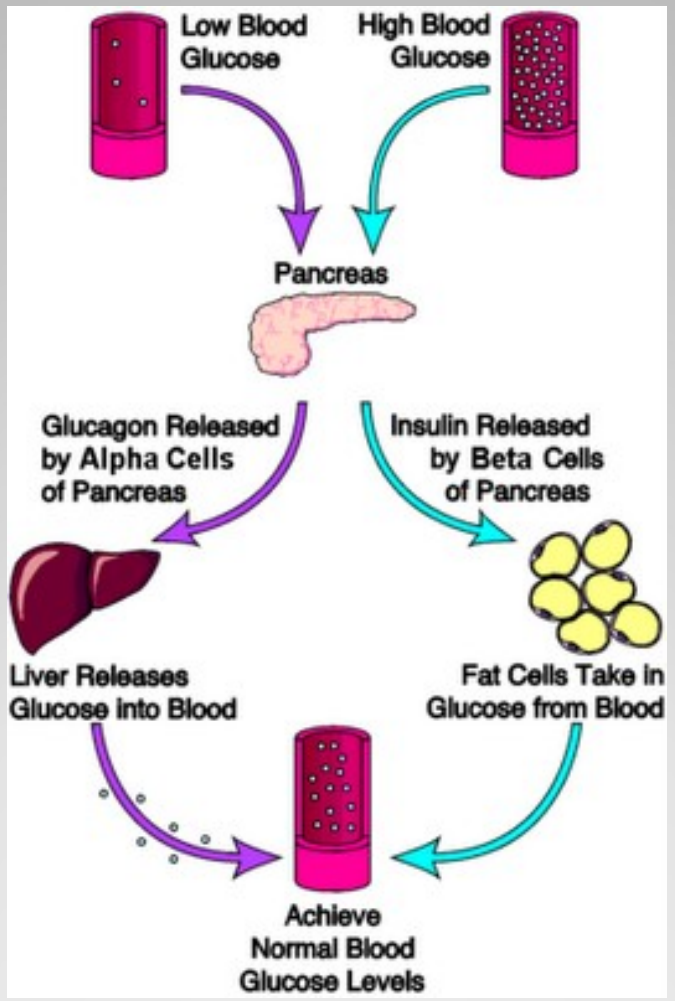
  Eating small meals, and eating often, actually has the most profound effect over time than almost anything that we see."

Excerpt from an interview with Jim Loehr,
author of *The Power of Full Engagement*

Blood Sugar Basics

- **Blood Sugar = Fuel**

- *Definition*:
  - The concentration of glucose in the blood
    - Normal Fasting Level: <100 mg/dl
    - Normal Post-Meal Level: <140 mg/dl
- *Source*:
  - Foods that we eat
  - Glycogen stored in muscles & liver


Low Blood Glucose
High Blood Glucose
Pancreas
Glucagon Released by Alpha Cells of Pancreas
Insulin Released by Beta Cells of Pancreas
Liver Releases Glucose into Blood
Fat Cells Take in Glucose from Blood
Achieve Normal Blood Glucose Levels

Blood Sugar Regulators

Hypoglycemia: Low Blood Sugar

- Mild: <70 mg/dl
  - Nausea
  - Extreme hunger
  - Feeling nervous or jittery
  - Cold, clammy, wet skin and/or excessive sweating not caused by exercise
  - A rapid heartbeat (tachycardia)
  - Numbness or tingling of the fingertips or lips
  - Trembling

Hypoglycemia: Low Blood Sugar

- Moderate: <55 mg/dl
  - Mood changes, such as irritability, anxiety, restlessness, or anger
  - Confusion, difficulty in thinking, or inability to concentrate
  - Blurred vision, dizziness, or headache
  - Weakness, lack of energy
  - Poor coordination
  - Difficulty walking or talking, such as staggering or slurred speech
  - Fatigue, lethargy, or drowsiness

- Severe: <35 – 40 mg/dl
  - Seizures or convulsions
  - Loss of consciousness, coma
  - Low body temperature (hypothermia)

Hypoglycemia: Low Blood Sugar

Hyperglycemia: High Blood Sugar

- Fasting: >130 mg/dl
- Post-Meal: >180 mg/dl
- Early Signs:
  - Increased thirst
  - Headaches
  - Difficulty concentrating
  - Blurred vision
  - Frequent urination
  - Fatigue (weak, tired feeling)
  - Weight loss

Hyperglycemia: High Blood Sugar

- Prolonged High Blood Sugar Signs:
  - Skin infections
  - Slow-healing cuts and sores
  - Decreased vision
  - Nerve damage causing painful cold or insensitive feet, loss of hair on the lower extremities, and/or erectile dysfunction
  - Stomach and intestinal problems such as chronic constipation or diarrhea

Diabetes =
Chronic High Blood Sugar

What is Diabetes?

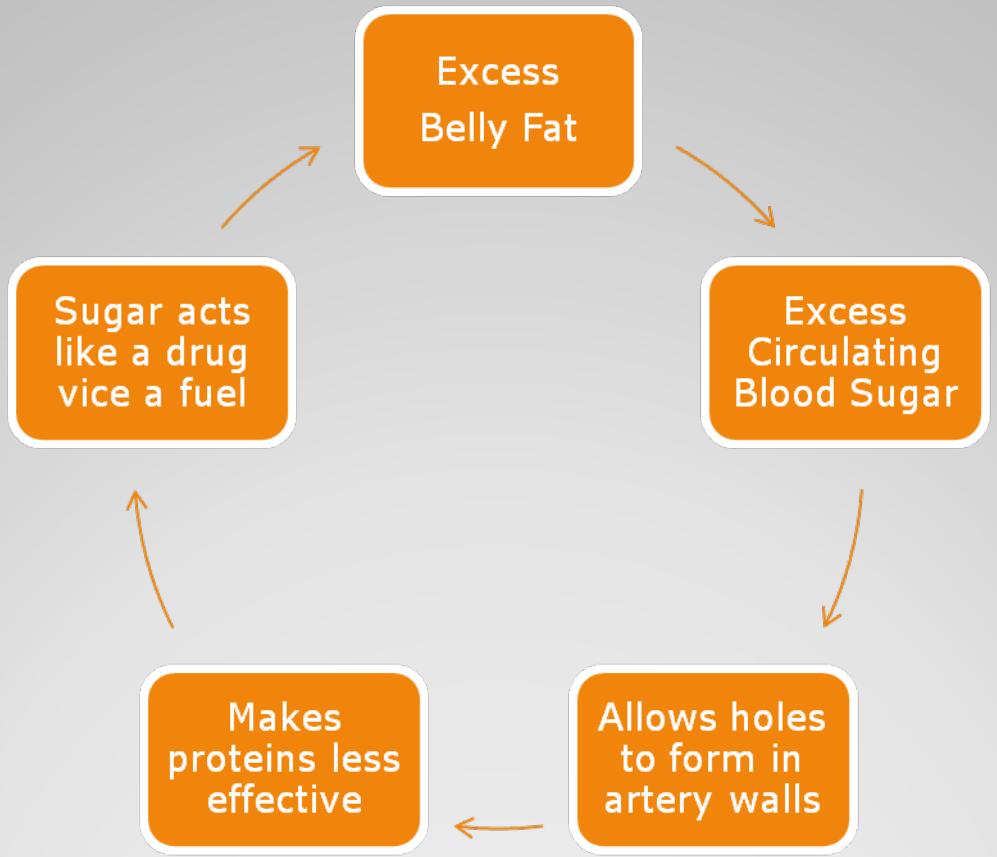
Types of Diabetes

- Prediabetes
  - Type 1
  - Type 2
- Gestational

Fat Types

- Bloodstream Fat =
  - Triglycerides
- Under Skin Fat =
  - Subcutaneous Fat
- Under Muscles in the Belly Fat =
  - Omentum Fat
    - Changes in omentum fat produce the biggest results in health markers (blood pressure, cholesterol, blood sugar levels)

- Belly Fat & Blood Sugar


Excess Belly Fat
Excess Circulating Blood Sugar
Allows holes to form in artery walls
Makes proteins less effective
Sugar acts like a drug vice a fuel

Balancing Blood Sugar

- Find & Decrease Hidden Sugars in Diet
- Notice Fiber to Sugar Proportion in Foods
- Balance Meals (Carbs / Fat / Protein)
- Build Muscle & Keep Walking

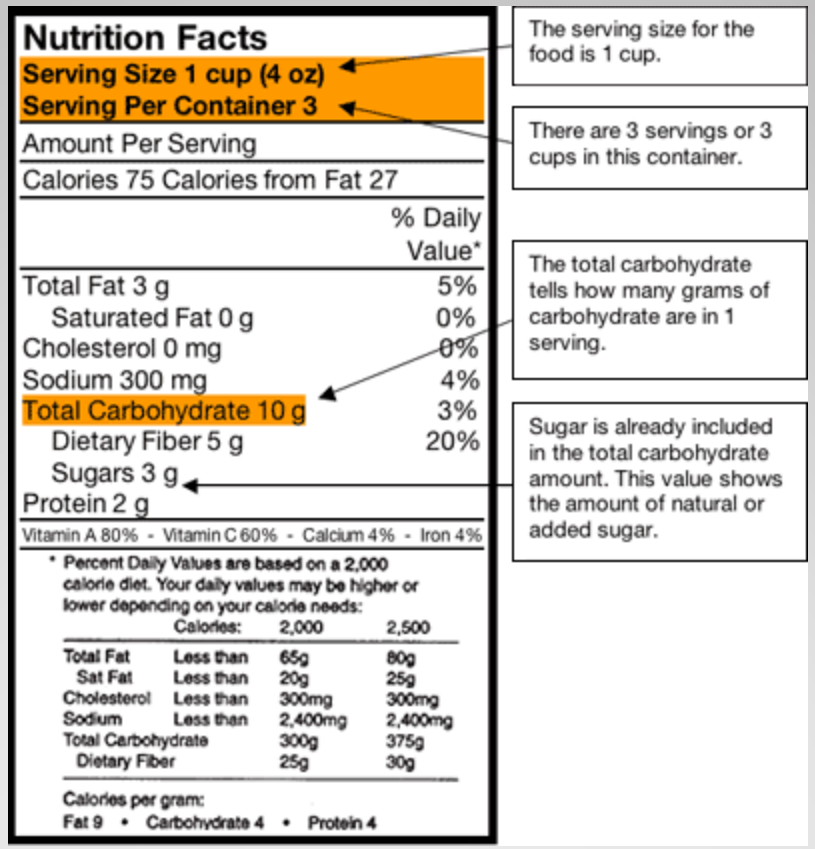
Hidden Sugars

"**. . .** the typical American now eats the equivalent of about 31 teaspoons (124 grams) of added sugar every day. That sugar alone adds up almost 500 extra calories—about 25% of the average person's caloric intake . . ."

Source: http://www.sparkpeople.com/resource/nutrition_articles.asp?id=616

- **Added sugars on labels include**:
  - sugar, white sugar, brown sugar, confectioner's sugar, turbinado sugar, raw sugar, invert sugar, beet sugar, cane sugar
  - corn syrup, high fructose corn syrup, corn sweetener
  - glucose, lactose, maltose, sucrose
  - dextrin, honey, maple syrup, evaporated cane juice, malt, molasses

- Proportion of fiber to sugar?


Nutrition Facts
Serving Size 1 cup (4 oz)
Serving Per Container 3
Amount Per Serving
Calories 75 Calories from Fat 27
% Daily Value*
Total Fat 3 g 5%
Saturated Fat 0 g 0%
Cholesterol 0 mg 0%
Sodium 300 mg 4%
Total Carbohydrate 10 g 3%
Dietary Fiber 5 g 20%
Sugars 3 g
Protein 2 g
Vitamin A 80% • Vitamin C 60% • Calcium 4% • Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:
Calories: 2,000 2,500
Total Fat Less than 65g 80g
Sat Fat Less than 20g 25g
Cholesterol Less than 300mg 300mg
Sodium Less than 2,400mg 2,400mg
Total Carbohydrate 300g 375g
Dietary Fiber 25g 30g
Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4
The serving size for the food is 1 cup.
There are 3 servings or 3 cups in this container.
The total carbohydrate tells how many grams of carbohydrate are in 1 serving.
Sugar is already included in the total carbohydrate amount. This value shows the amount of natural or added sugar.

Balance Fiber & Sugar

Fruit	Fiber Content	Sugar Content
Avocado (1 medium)	10 grams	<1 gram
Raspberries (1 cup)	8 grams	5.5 grams
Strawberries (1 cup)	3 grams	7 grams
Blueberries (1 cup)	3.6 grams	14.5 grams
Banana (1 medium)	3 grams	14.5 grams
Grapefruit (1 large: pink or red)	3.9 grams	16.95 grams
Apple (1 medium)	4.4 grams	19 grams
Cherries (1 cup, sweet)	3.2 grams	19.74 grams
Orange (1 large)	2.4 grams	23 grams

Naturally Sweet: Fruit

Vegetable	Fiber Content	Sugar Content
Sweet Potato (1 med)	3.8	7.39
Pumpkin (1 cup)	2.7	2.50

Naturally Sweet: Vegetables

Naturally Sweet: Honey

- Honey contains micronutrients:
  - niacin, riboflavin, pantothenic acid (vitamin B5), calcium, copper, iron, magnesium, manganese, phosphorus, potassium and zinc.
- Honey is rich in antioxidants:
  - Darker colored honeys are richer in antioxidants
- Honey does not seem to impact blood sugar the same way other sugars do

Chromium:

a mineral that could help control blood sugar

Chromium-Rich Foods:

romaine lettuce, broccoli, green beans, mushrooms, onions, tomatoes, liver, oysters, whole grains, bran cereals, potatoes

Chromium

Damage Control

- If you go overboard on sugar . . .
  - Adding nuts or olive oil will slow the sugar's absorption
  - Adding ½ teaspoon of cinnamon promotes fullness, reduces blood sugar and cholesterol

Balanced Meals

- Slow Digesting Carbs +
- Some Protein +
- Some Fat =
- A Blood Sugar Balancing Meal or Snack

Exercise & Blood Sugar

- Just:
  - 30 minutes of walking / jogging per day &
  - 20 minutes of strength work 3 times per week
  - Increases muscles' receptivity to circulating blood sugar

Resources

- Nutrient Content of Foods:
  - http://www.ars.usda.gov/main/site_main.htm?modecode=12-35-45-00
- Help Guide & Harvard University's *Understanding Diabetes*
  - http://www.helpguide.org/harvard/understanding_diabetes.htm
- American Diabetes Association
  - www.diabetes.org
- Help Guide's *Diabetes Diet and Food Tips*
  - http://www.helpguide.org/life/healthy_diet_diabetes.htm
- American Diabetes Association Meal Tips
  - http://www.diabetes.org/food-and-fitness/food/planning-meals/diabetes-meal-plans-and-a-healthy-diet.html

Points of Contact

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(504) 697-9768 (Fax)

http://www.marines.mil/unit/marforres/MFRHQ/MCCS/SemperFit/Health.aspx

http://www.facebook.com/pages/New-Orleans-LA/MCCSSEMPER-FIT-MARFORRES/126284770729139

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MCCS MARINE CORPS Community Services

UNITED STATES MARINE CORPS SEMPER FIT SPORTS, RECREATION & FITNESS